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57. (Amended) The method according to claim 56, wherein the estimation step includes the step of determining the command on the basis of storage information which defines in advance a relationship between the action of the user and the corresponding command.

58. The method according to claim 57, wherein the object to be controlled displays an image corresponding to the command

#### REMARKS

Applicant requests favorable reconsideration and allowance of this application in view of the foregoing amendments and the following remarks.

Claims 1-58 are pending in this application, with Claims 1, 14, 18, 29, 30, 45, and 52 being independent.

Claims 1, 14-16, 18, 29, 30, 38, 45, 49-52, and 56 have been amended.

Applicant submits that support for the amendments can be found in the original disclosure, and therefore no new matter has been added.

Claims 1-11, 14-26, 29-38, and 41-58 were rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 5,846,134 (Latypov). Claims 12, 13, 27, 28, 39, and 40 were rejected under 35 U.S.C. §103 as being obvious over Latypov. Applicant respectfully traverses those rejections for the reasons discussed below.

As set forth in Claims 1, 14, 18, 29, and 30, the present invention includes the feature of estimating an action of a user on the basis of *both* the absolute (or detected) positions of first and second sensors (or first and second portions of a user) and a relative

position (or change in relative position) of a second portion of the user with respect to a first portion of the user, which positions are detected by first and second sensors. As recited in Claims 45 and 52, the present invention includes the feature of estimating a command input by a user on the basis of patterns of the outputs of first and second sensors on first and second portions of the user (or first and second detection steps) by analyzing outputs from the first and second sensors (or first and second detection steps).

Due to the above-mentioned features, as discussed for example at least at page 13, line 19 to page 14, line 20 of the specification, the present invention as recited in Claims 1, 14, 18, 29, 30, 45, and 52 improves the estimation precision of a user's action (intention) by taking both the absolute location of first and second sensors and a relative location into consideration. Applicant submits that the cited art fails to disclose or suggest at least the above-mentioned features.

Latypov discloses an apparatus for immersion into virtual reality. The Examiner contends that this reference discloses means for analyzing and generating action information of the player/user on the basis of a relative location/posture of the hand or arm with respect to the location/posture of the head. Even if the Examiner is correct, Applicant submits that Latypov nevertheless fails to disclose or suggest that the posture of the player/user is considered to determined the player/user's action, and therefore it does not disclose or suggest improving the estimation precision of the user's action (intention) by taking *both* the absolute location of the first and second sensors (i.e., body portions) and the relative location (or change in relative location) into consideration.

Claims 1-11, 13-26, 28-38, and 40-58 were rejected under Section 102 as being anticipated by U.S. Patent No. 5,913,727 (Ahdoot). Claims 12, 27, and 39 were

rejected under Section 103 as being obvious over Ahdoot. Applicant respectfully traverses those rejections for the reasons stated below.

Ahdoot discloses an interactive movement and contact simulation game which allows a physical contact sport to be enacted between a player and a computer-generated three-dimensional moving image. That patent discloses a plurality of sensors 30 to detect positions of a player's hands, feet, and head, as well as a plurality of inertial sensors 46 to determine whether a movement of a hand/foot is a kick/punch. However, the apparatus of Ahdoot only considers an output from a single sensor to determine the player's action. Applicant submits that it does not disclose or suggest estimating a user's action on the basis of both the absolute location of two sensors (i.e., body portions) and a relative location (or change in relative location) of the second sensor (or body portion).

In view of the foregoing, Applicant submits that the present invention recited in Claims 1, 14, 18, 29, 30, 45, and 52 is patentable over the cited art.

Dependent Claims 2-13, 15-17, 19-28, 31-44, 46-51, and 53-58 recite additional features that further distinguish the present invention from the cited art. Further individual consideration of the dependent claims is requested.

For the foregoing reasons, Applicant submits that this application is in condition for allowance. Entry of this Amendment, favorable reconsideration, withdrawal of the rejections set forth in the above-mentioned Office Action, and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, DC office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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## APPENDIX

### **MARKED-UP VERSION SHOWING AMENDMENTS TO CLAIMS**

1. (Amended Twice) A user interface apparatus comprising:  
a first sensor attached to a first portion of a body of a user;  
a second sensor attached to a second portion of the user, which is different  
from the first portion;  
means for estimating [analyzing] an action of the user on the basis of both  
the absolute positions of said first and second sensors and a relative position of the second  
portion with respect to the first portion, which are [is] detected by said first and second  
sensors, and for generating action information corresponding to the estimated action of the  
user; [and]

determination means for determining a user instruction corresponding to the  
generated action information, and

image generating means for generating an image on the basis of said user  
instruction.

14. (Amended Twice) A game apparatus comprising:  
a first sensor for detecting a location/posture of a head of a player;  
a second sensor for detecting a location/posture of a hand or arm of the  
player;

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means for estimating an action of the player on the basis of both the  
absolute positions of said first and second sensors and a change of a relative  
location/posture of the hand or arm with respect to the location/posture of the head, which  
are detected by said first and second sensors; [and]

means for outputting a player command corresponding to the estimated  
action, and

means for generating an image on the basis of the player command.

15. (Amended) The apparatus according to claim 14, further comprising  
display means for displaying images generated by said means for generating [an image of a  
game scene] in front of the head of the player for the player.

16. (Amended) The apparatus according to claim [14] 15, wherein said  
display means is a head-mounted display.

18. (Amended Twice) A user interface method for outputting a user  
instruction to a predetermined apparatus or program, comprising:  
the step of detecting a location of a first portion of a body of a user and a  
location of a second portion of the user, which is different from the first portion, by using  
first and second sensors attached to the user; and

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the step of estimating [determining] a user instruction by analyzing an action of the user on the basis of both the detected locations of the first and second portions and a relative position of the second portion with respect to the first portion, which are detected by said first and second sensors, and outputting the determined user instruction to the apparatus or program.

29. (Amended Twice) A computer readable storage medium, which stores a program of a user interface method for outputting a user instruction to a predetermined apparatus or program, storing:

a program step of detecting a location of a first portion of a body of a user and a location of a second portion of the user, which is different from the first portion, by using first and second sensors attached to the user; and

a program step of estimating [determining] a user instruction by analyzing an action of the user on the basis of both the detected locations of the first and second portions and a relative position of the second portion with respect to the first portion, which are detected by said first and second sensors, and outputting the determined user instruction to the apparatus or program.

30. (Amended Twice) A game apparatus for displaying a computer graphics image in front of a field of view of a player, comprising:

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a first sensor for detecting a location of a first portion of a body of the player;

a second sensor for detecting a location of a second portion of the player, which is different from the first portion; and

game progress means for proceeding with a game by estimating [determining] a command the player wants to input by analyzing both the detected locations of the first and second portions and a change of a relative position of the second portion with respect to the first portion, which are detected by said first and second sensors, and executing the estimated [determined] command in a process of the game.

38. (Amended) The apparatus according to claim 30, wherein said game progress means decomposes the estimated [determined] player command into a plurality of operands, and executes the command in accordance with the plurality of decomposed operands.

45. (Amended) An interface apparatus comprising:  
a first sensor for detecting a location or motion of a first portion of a body of a user;  
a second sensor for detecting a location or motion of a second portion of the user, which is different from the first portion;

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estimation [determination] means for estimating [analyzing outputs from said first and second sensors and determining] a command input by the user on the basis of patterns of the outputs from said first and second sensors by analyzing outputs from said first and second sensors; and

output means for outputting the command estimated [determined] by said estimation [determination] means to an object to be controlled.

49. (Amended) The apparatus according to claim 48, wherein said estimation [determination] means analyzes an action of the user using information of a change in location, the location change velocity, location change acceleration, and relative moving direction of the second portion with respect to the first portion, and specifies a command corresponding to the action.

50. (Amended) The apparatus according to claim 49, wherein said estimation [determination] means has storage information which defines in advance a relationship between the action of the user and the corresponding command.

51. (Amended) The apparatus according to claim 50, wherein the command output from said estimation [determination] means is supplied to the object to be controlled, and an image corresponding to the command is displayed.

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52. (Amended) A user interface method comprising:

the first detection step of detecting a location or motion of a first portion of a body of a user;

the second detection step of detecting a location or motion of a second portion of the user, which is different from the first portion;

the estimation [determination] step of estimating [analyzing outputs of the first and second detection steps and determining] a command input by the user on the basis of patterns of the outputs of the first and second detection steps by analyzing outputs from said first and second detection steps; and

the output step of outputting the command estimated [determined] in the estimation [determination] step to an object to be controlled.

56. (Amended) The method according to claim 55, wherein the estimation [determination] step includes the step of analyzing an action of the user using information of a change in location, the location change velocity, location change acceleration, and relative moving direction of the second portion with respect to the first portion, and specifying a command corresponding to the action.

57. (Amended) The method according to claim 56, wherein the estimation [determination] step includes the step of determining the command on the basis of storage

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information which defines in advance a relationship between the action of the user and the corresponding command.

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